

AMENDMENTS TO THE CLAIMS:

The listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) In an electric arc welder operated to perform a short circuit welding process between an electrode and a workpiece, said process comprising a succession of alternate short circuit conditions and arc conditions, with a first waveform during said short circuit condition and a second waveform during said arc condition, a first waveform generator to construct said first waveform from a series of current pulses controlled by a pulse wave modulator operated at a rate greater than 18 kHz and a second waveform generator to construct said second waveform from a series of current pulses controlled by a pulse wave modulator operated at a rate greater than 18 kHz, the improvement comprising: said first waveform generator having a circuit to generate said first waveform as a current control signal and said second waveform generator having a circuit to generate said second waveform, with a generally constant arc parameter, as one of a constant voltage signal or a constant wattage signal, wherein said first waveform generator and said second waveform generator are configured to operate in a generally sequential fashion with respect to each other.

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Currently amended) The improvement as defined in ~~claim 4~~claim 1 including a voltage detector device with a circuit to sense the arc voltage between said electrode and said workpiece and a circuit to shift said weld process from said short circuit condition to said arc condition upon creation of an arc signal from said detector device when said sensed voltage is greater than a given value.

6. (Currently amended) The improvement as defined in claim 5 wherein said welder includes ~~a~~an arc switch in series with said electrode and said workpiece, a resistor in parallel with said arc switch and a circuit to open said arc switch upon creation of said arc signal.

7. (Currently amended) ~~An~~The improvement as defined in claim 6 including an inductor in series with said arc switch.

8. (Currently amended) The improvement as defined in ~~claim 3~~claim 1 including a voltage detector device with a circuit to sense the arc voltage between said electrode and said workpiece and a circuit to shift said weld process from said short circuit condition to said arc condition upon creation of an arc signal from said detector device when said sensed voltage is greater than a given value.

9. (Currently amended) The improvement as defined in claim 8 wherein said

welder includes ~~a~~an arc switch in series with said electrode and said workpiece, a resistor in parallel with said arc switch and a circuit to open said arc switch upon creation of said arc signal.

10. (Currently amended) ~~An~~The improvement as defined in claim 9 including an inductor in series with said arc switch.

11. (Currently amended) The improvement as defined in ~~claim 2~~claim 1 including a voltage detector device with a circuit to sense the arc voltage between said electrode and said workpiece and a circuit to shift said weld process from said short circuit condition to said arc condition upon creation of an arc signal from said detector device when said sensed voltage is greater than a given value.

12. (Currently amended) The improvement as defined in claim 11 wherein said welder includes ~~a~~an arc switch in series with said electrode and said workpiece, a resistor in parallel with said arc switch and a circuit to open said arc switch upon creation of said arc signal.

13. (Currently amended) ~~An~~The improvement as defined in claim 12 including an inductor in series with said arc switch.

14. (Original) The improvement as defined in claim 1 including a voltage detector device with a circuit to sense the arc voltage between said electrode and said workpiece

and a circuit to shift said weld process from said short circuit condition to said arc condition upon creation of an arc signal from said detector device when said sensed voltage is greater than a given value.

15. (Currently amended) The improvement as defined in claim 14 wherein said welder includes ~~a~~an arc switch in series with said electrode and said workpiece, a resistor in parallel with said arc switch and a circuit to open said arc switch upon creation of said arc signal.

16. (Currently amended) ~~An~~The improvement as defined in claim 15 including an inductor in series with said arc switch.

17. (Original) The improvement as defined in claim 16 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

18. (Original) The improvement as defined in claim 15 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

19. (Original) The improvement as defined in claim 13 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

20. (Original) The improvement as defined in claim 12 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

21. (Original) The improvement as defined in claim 10 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

22. (Original) The improvement as defined in claim 9 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

23. (Original) The improvement as defined in claim 7 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

24. (Original) The improvement as defined in claim 6 including a circuit for creating a neck signal upon an impending break in a short circuit during said short circuit condition and a circuit to override said arc signal by said neck signal.

25. (Currently amended) The improvement as defined in claim 14 wherein said first waveform is a current control waveform with includes a first slope, a break point and

then a second slope.

26. (Currently amended) The improvement as defined in claim 7 wherein said first ~~waveform is a current~~ control waveform ~~with~~ includes a first slope, a break point and then a second slope.

27. (Currently amended) The improvement as defined in claim 6 wherein said first ~~waveform is a current~~ control waveform ~~with~~ includes a first slope, a break point and then a second slope.

28. (Currently amended) The improvement as defined in claim 5 wherein said first ~~waveform is a current~~ control waveform ~~with~~ includes a first slope, a break point and then a second slope.

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Currently amended) The improvement as defined in claim 1 wherein said first ~~waveform is a current~~ control waveform ~~with~~ includes a first slope, a break point and then a second slope.

33. (Currently amended) An electric arc welder operated to perform a short circuit welding process between an electrode and a workpiece, said process comprising a succession of alternate short circuit conditions and arc conditions, with a first current controlled waveform during said short circuit condition and one of a second constant voltage controlled waveform or a second constant power controlled waveform during said arc condition, a first waveform generator to construct said first waveform from a series of current pulses controlled by a pulse wave modulator operated at a rate greater than 18 kHz and a second waveform generator to construct said second waveform from a series of current pulses controlled by a pulse wave modulator operated at a rate greater than 18 kHz, wherein said first waveform includes a first slope, a break point and then a second slope.

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Currently amended) ~~An~~ The electric arc welder as defined in claim 33 including a voltage detector device with a circuit to sense the arc voltage between said electrode and said workpiece and a circuit to shift said weld process from said short circuit condition to said arc condition upon creation of an arc signal from said detector device

when said sensed voltage is greater than a given value.

38. (Currently amended) ~~An~~The electric arc welder as defined in claim 37 wherein said welder includes ~~a~~an arc switch in series with said electrode and said workpiece, a resistor in parallel with said arc switch and a circuit to open said arc switch upon creation of said arc signal.

39. (Currently amended) ~~An~~The electric arc welder as defined in claim 38 including an inductor in series with said arc switch.

40. (Currently amended) ~~An~~The electric arc welder as defined in claim 37 including a break point circuit to manually adjust the current level of said break point in response to a control signal.

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Currently amended) ~~An~~The electric arc welder as defined in claim 33 including a break point circuit to manually adjust the current level of said break point in response to a control signal

45. (Currently amended) ~~An~~The electric arc welder as defined in claim 44 wherein said break point circuit includes a circuit to create a voltage signal manually adjustable to change the voltage of said second waveform and a switch to apply said voltage signal as said control signal.

46. (Canceled)

47. (Canceled)

48. (Canceled)

49. (Currently amended) ~~An~~The electric arc welder as defined in claim 40 wherein said break point circuit includes a circuit to create a voltage signal manually adjustable to change the voltage of said second waveform and a switch to apply said voltage signal as said control signal.

50. (Currently amended) An electric arc welder operated to perform a short circuit welding process between an electrode and a workpiece, said process comprising a succession of alternate short circuit conditions and arc conditions, with a first current controlled waveform during said short circuit condition, a first waveform generator to construct said first waveform from a series of current pulses controlled by a pulse wave modulator operated at a rate greater than 18 kHz, wherein said first waveform includes a

first slope, a break point and then a second slope, and a break point circuit to set the current of said break point in response to an input signal, a first manually adjustable input signal for said break point circuit, a second manually adjustable input signal for said break point circuit and a switch to connect one of said input signals to said break point circuit, wherein the first manually adjustable input signal represents a first circuit parameter and the second manually adjustable input signal represents a second circuit parameter, the first circuit parameter and second circuit parameter being different from each other.

51. (Canceled)

52. (Currently amended) An electric arc welder as defined in claim 51 wherein said second circuit parameter is the voltage of said welder.